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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/766,258 | 01/27/2004 | Shinichi Hara | 1232-5266 | 4150 |

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EXAMINER


NELSON, VIVIAN HSU

ART UNIT PAPER NUMBER

2851

DATE MAILED: 09/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|--------------------------------------|---------------------------------------|--|
| Office Action Summary | Application No. 10/766,258 | Applicant(s) HARA, SHINICHI | |
| | Examiner Vivian Nelson | Art Unit 2851 |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
 - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
 - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
 - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 August 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) 8 and 9 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7 and 10-14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 July 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

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Responsive to communication filed on 11 August 2005.

The restriction requirement is restated as follows:

- Group I: Claims 1-7 and 10-14, drawn to an exposure apparatus and absorption/blocking member, classified in class 355; and
- Group II: Claims 8 and 9, drawn to a holder, classified in class 269.

Applicant elects to pursue the claims of Group I with traverse. Applicant submits that the restriction is improper because all the claims are properly presented in the application and diverse burdensome searching is not required; therefore, all the claims should be examined together.

The office has reconsidered the initial restriction requirement based on the traversal arguments made by the applicant and finds that the traversal arguments are not persuasive. The requirement is still deemed proper and is therefore made FINAL.

The claims of Group II (i.e. 8 and 9) are hereby withdrawn; consideration and treatment of the claims of Group I (i.e. 1-7 and 10-14) is as follows:

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities:
 - a. On page 3, line 1, the term “catoptric” is misspelled.

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- b. The reference number 230 has multiple designations. On page 15, line 9, it is referred to as a “plate”; on page 19, line 20, it is called a “controller”; on page 20, lines 12 and 15, it is named the “drive mechanism”; on page 25, lines 12, 19, 23, and 26, it is again called a “controller”. Are the terms “plate”, “controller”, and “drive mechanism” interchangeable?
 - c. The “mask stage” of page 15, line 15 should be numbered 125, not 25.
 - d. The “pipe” (reference number 134) on page 17, line 2 is not shown in any of the figures.
 - e. The “controller” (reference number 230A) on pages 22, 23, and 25 is not shown in any of the figures.
 - f. On page 28 (line 1) the specification refers to a Figure 12, which is not found anywhere in the drawings.
- Appropriate correction is required.

Drawings

2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character “140” has been used to designate both the object (substrate) and the wafer stage – see Fig. 4. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheets should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either “Replacement Sheet” or “New

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Sheet” pursuant to 37 CFR 1.121(d). If the examiner does not accept the changes, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-2, 5-6, 10, and 13 are rejected under 35 U.S.C. 102(b) as being unpatentable by Miwa (Japanese Laid-Open Patent Application 7-301845).

3. For claim 1 Miwa teaches an exposure apparatus 100 that has an exposure mode for transferring a pattern from a reticle 120 to an object 140, and a standby mode that waits for exposure, comprising:

an optical system 130 for introducing the exposure light to the object 140 during exposure mode (Fig 1, reference 21); and

a mechanism for allowing the exposure light to enter the reticle 120 and/or the optical system 130 in the standby mode, and for preventing the exposure light from entering the object 140 in the standby mode (Fig 1, ref. 25 and Fig 2a).

Further, it can be shown from Miwa that the exposure apparatus of claim 1 has the device fabrication method of claim 13, which includes:

exposing an object 140 by using an exposure apparatus (Fig 1); and

developing the object 140 that has been exposed, where the exposure apparatus has an exposure mode that transfers a pattern of a reticle 120 onto an object 140, and a standby mode that waits for exposure. Miwa's light shielding plates are adjustable to different size diameters, allowing for both an exposure mode and a standby mode.

4. Miwa's reference shows that the light source 112 emits exposure light in the standby mode in the purpose section of the abstract – i.e. Miwa wants to obtain smooth movement of the light shielding plates while a strong ultraviolet light is being projected into the system.

5. Figure 1 in Miwa's disclosure shows a projection optical system 130 for projecting the pattern onto an object 140, where the first position is located between the projection optical system 130 and the object 140 as in claim 5. In this case, the light shielding plate is shown to be apart of the optical system 130 and is assumed to be at the object-end of the optical system 130; therefore, the light shielding mechanism is between the optical system 130 and the object 140.

6. Regarding claim 6, Miwa also teaches a movable stage 145 for supporting the object 140, which includes a drive mechanism for moving the stage 145 and the object 140 to a position apart from the optical path of the exposure light – see Figs 1 and 5.

7. The description in Miwa's abstract discusses being able to control the aperture diameter of the light shielding plate, which can be applied to the standby method in claim 10. Specifically, Miwa's light shielding plate can be closed (“into fine contact with each other”) in order to allow the exposure light to reach the reticle 120 and/or the optical system 130; and shielding the object 140 from the exposure light during the irradiating step.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 3-4, 7, and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miwa in view of Tsuji (patent #6,919,951).

8. As to claim 3 Miwa teaches an ultraviolet (UV) light for image exposure in the abstract. Tsuji also uses UV light (column 4 lines 9-11) from the extreme ultraviolet section of the electromagnetic spectrum; both references use a light source with wavelengths in the nanometer range. It would have been obvious to use the ultraviolet light of Tsuji in place of or in addition to Miwa's UV light source in order to obtain a relatively higher device pattern integration, since a person ordinarily skilled in lithographic manufacturing technology would have basic knowledge as to the relationship of light wavelength and image resolution.

As to claim 11, the use of reduced atmospheric pressure (col. 8 lines 48-49) in Tsuji would be applicable to Miwa since the equipment necessary for extending the range of Miwa's light source into the extreme ultraviolet end of the spectrum would require conventional operation in a vacuum. It would be obvious to those working in the art to use the vacuum of chamber of Tsuji in Miwa to extend the electromagnetic spectrum frequency range to improve image resolution.

9. In regards to claims 4 and 7, the drive mechanism 220 and controller needed to move a light blocking member 210 into a first position directly in the exposure light's optical path and a second position away from the optical path as taught by Miwa (abstract and Fig 1) and Tsuji (col.

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12 lines 29-30). During preparation of the apparatus, it would be obvious to block and absorb the ultraviolet light from the light source, including any scattered wavelengths, which may prematurely reach the light sensitive coating on the object to be exposed. It would be obvious to one skilled in the art to use an ultraviolet light absorbing material from Tsuji onto the blocking member of Miwa to prevent pre-exposure of the object and thereby improve throughput of the system.

Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Miwa in view of Tsutsui (patent #4,720,732).

10. Miwa teaches a piezoelectric sensor to detect unwanted oscillations on the light shielding plate for a smooth turning action (see abstract). Tsutsui teaches a temperature measuring platinum resistor for determining the temperature of the wafer chuck so that the wafer can be preparatively adjusted to the same temperature as the wafer chuck for improved throughput of the system (abstract and col. 2 lines 53-55, 65-67). Since both Miwa and Tsutsui teach sensors to monitor the operation of the system, it would be obvious to one of ordinary skill in the art to use sensors on the wafer chuck to track fluctuations in temperature and vibrations to maintain high quality throughput of the system.

Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tsutsui in view of Kitabayashi et al. (patent #6,768,627).

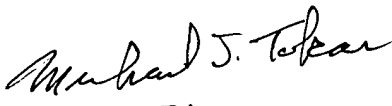
11. Tsutsui teaches a wafer chuck for holding a substrate or object and temperature-measuring platinum resistor sensor on the wafer chuck (col. 2 lines 53-55). Kitabayashi describes

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an electrostatic wafer chuck and a temperature sensor for controlling a heating/cooling apparatus and temperature controller (col. 2 lines 1-5). Tsutsui and Kitabayashi both teach sensors on their wafer chucks to determine the temperature of the wafer chuck before placing the wafer in contact with it. Tsutsui uses a mechanism to heat the wafer so that its temperature is similar to that of the wafer chuck (abstract). Kitabayashi minimizes the contact ratio between the chuck and the wafer to 20%, which also generates a large attracting force between the chuck and the wafer to fix the substrate to the chuck, so that the chuck's temperature doesn't have to be adjusted too much before coming into contact with the substrate (col. 10 lines 10-11, 31-41, and 49). Since both Tsutsui and Kitabayashi teach minimization of temperature fluctuations between the chuck and the wafer, it would be obvious to one skilled in the art to use a wafer chuck with the contact area ratio being 20% to minimize temperature changes because of alignment reliability.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

vhn


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